

CLAIMS

1. A process for preparing a substantially linear olefinic hydrocarbon mixture comprising the step of contacting a lower olefin feed comprising one or more C₃ to C₆ lower olefins in the presence of water and under olefin oligomerization conditions with a catalyst comprising surface-deactivated ZSM-23.
2. The process according to Claim 1, wherein said ZSM-23 has been surface deactivated with a sterically hindered nitrogenous base.
3. The process according to Claim 2, wherein the nitrogenous base is 2,4,6-collidine.
4. The process according to any preceding Claim, wherein the feed comprises propylene and butene.
5. The process according to Claim 4, wherein that the mole ratio of propylene to butene in the feed is in a range of about 99:1 to about 1:99.
6. The process according to Claim 4, wherein the mole ratio of propylene to butene in the feed is in a range of about 49:51 to about 5:95.
7. The process according to Claim 4, wherein the mole ratio of propylene to butene in the feed is in a range of about 35:65 to about 10:90.
8. The process according to any preceding Claim, wherein the concentration of water in the feed is in a range of from about 25 ppm to about 1000 ppm.
9. The process according to any preceding Claim, wherein the concentration of water in the feed is in the range of from about 100 ppm to about 750 ppm.

10. The process according to any preceding Claim, wherein the concentration of water in the feed is in the range of from about 575 ppm to about 625 ppm.
11. The process according to any preceding Claim, wherein the water is contacted with the feed prior to contacting of the feed with the catalyst.
12. The process according to Claim 11, wherein the water and the feed are contacted at a temperature in the range of from about 20°C to about 60°C.
13. The process according to any preceding Claim, wherein the feed is water-saturated.
14. The process according to any preceding Claim, wherein the oligomerization conditions comprise a pressure in the range of from about 500 psig (3447 KPa (gauge)) to about 1500 psig (10342 KPa (gauge)).
15. The process according to any preceding Claim, wherein the oligomerization conditions comprise a pressure in the range of from about 750 psig (5171 KPa (gauge)) to about 1250 psig (8618 KPa (gauge)).
16. The process according to any preceding Claim, wherein the oligomerization conditions comprise a temperature in the range of from about 160°C to about 250°C.
17. The process according to any preceding Claim, wherein the oligomerization conditions comprise a temperature in the range of from about 190°C to about 230°C.
18. The process according to any preceding Claim, wherein the oligomerization conditions comprise a temperature in the range of from about 210°C to about 220°C.

19. The process according to any preceding Claim, wherein the oligomerization conditions comprise a weight hourly space velocity of from about 0.1 hr^{-1} to about 4.0 hr^{-1} .

20. The process according to any preceding Claim, wherein the oligomerization conditions comprise a weight hourly space velocity of from about 0.2 hr^{-1} to about 3.0 hr^{-1} .

21. The process according to any preceding Claim, wherein the oligomerization conditions comprise a weight hourly space velocity of from about 1.75 hr^{-1} to about 2.25 hr^{-1} .

22. The process according to any preceding Claim, wherein the substantially linear olefinic hydrocarbon mixture comprises at least 85% by weight of mono-olefin oligomers of the empirical formula:



where n is greater than or equal to 6, said mono-olefin oligomers comprising at least 20 percent by weight of olefins having at least 12 carbon atoms, said olefins having at least 12 carbon atoms having an average of from 0.8 to 2.0 $\text{C}_1\text{-C}_3$ alkyl branches per carbon chain.

23. The process according to Claim 22 wherein said olefins having at least 12 carbon atoms have an average of from 0.8 to 1.3 $\text{C}_1\text{-C}_3$ alkyl branches per carbon chain.